

### **Abstract**

Methods and systems are disclosed for fabricating ultra-low dielectric constant porous materials. In one aspect of the invention, a method for making porous low-k films is disclosed. The method uses polymer based porogens as sacrificial templates around 5 which a chemical vapor deposition (CVD) or plasma enhanced chemical vapor deposition (PECVD) deposited matrix is formed. Upon pyrolysis, the porogens decompose resulting in a porous ultra-low dielectric material. This method can be used, for example, to produce porous organosilicate glass (OSG) materials, ultra-low dielectric nanoporous materials, porous ceramics, porous scaffolds, and/or porous metals. Various uses and 10 embodiments of the methods and systems of this invention are disclosed.

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